

CLAIMS

What is claimed is:

- 5 1. A pad layout for mounting with a circuit board component, the pad layout comprising:
 a set of pads arranged on a surface of a circuit board in a two-dimensional array having at least two pads in a first direction and at least two pads in a second direction that is substantially perpendicular to the first direction, each pad of the
10 set of pads having (i) a central portion and (ii) multiple lobe portions integrated with the central portion and extending from the central portion of that pad.
2. The pad layout of claim 1 wherein, for each pad of the set of pads, that pad has exactly four lobe portions that extend from the central portion of that pad.
- 15 3. The pad layout of claim 2 wherein, for each pad of the set of pads, two of the four lobe portions of that pad extend along a first axis, and another two of the four lobe portions of that pad extend along a second axis that is substantially perpendicular to the first axis.
- 20 4. The pad layout of claim 1 wherein each pad of the set of pads has a profile having multiple outer radii of substantially 3 mils.
5. The pad layout of claim 4 wherein the profile of each pad of the set of pads further
25 has multiple concave radii of substantially 8 mils.
6. The pad layout of claim 1, further comprising:

5 solder mask on the surface of the circuit board, the solder mask extending around a periphery of each pad of the set of pads, the solder mask defining a set of apertures, each aperture having (i) a central aperture portion and (ii) multiple lobe aperture portions integrated with the central aperture portion to mirror a profile of a corresponding pad.

7. The pad layout of claim 6 wherein the solder mask further defines clearance regions that are substantially 2 mils wide around each pad of the set of pads.
- 10 8. The pad layout of claim 1 wherein each pad of the set of pads substantially has:
 - a first length along a first axis and the first length
 - along a second axis that is substantially perpendicular to the
 - first axis, and
 - a second length along a third axis and the second
 - 15 length along a fourth axis that is substantially perpendicular
 - to the third axis; andwherein the second length is greater than the first length.
- 20 9. The pad layout of claim 8 wherein the first and second axes are pivoted from the third and fourth axes by substantially 45 degrees.
10. The pad layout of claim 8 wherein the first length is substantially 18 mils and the second length is substantially 24 mils.
- 25 11. A circuit board, comprising:
 - a set of circuit board layers combined to form a rigid planar structure
 - having an outer surface; and

a pad layout configured to mount with a circuit board component, the pad layout including a set of pads arranged on the surface of a circuit board in a two-dimensional array having at least two pads in a first direction and at least two pads in a second direction that is substantially perpendicular to the first direction, each pad of the set of pads having (i) a central portion and (ii) multiple lobe portions integrated with the central portion and extending from the central portion of that pad.

12. The circuit board of claim 11 wherein, for each pad of the set of pads, that pad has exactly four lobe portions that extend from the central portion of that pad, two of the four lobe portions of that pad extending along a first axis, and another two of the four lobe portions of that pad extending along a second axis that is substantially perpendicular to the first axis.
13. The circuit board of claim 11 wherein each pad of the set of pads has a profile having multiple outer radii of substantially 3 mils, and multiple concave radii of substantially 8 mils.
14. The circuit board of claim 11, further comprising:
solder mask on the surface of the circuit board, the solder mask extending around a periphery of each pad of the set of pads, the solder mask defining a set of apertures, each aperture having (i) a central aperture portion and (ii) multiple lobe aperture portions integrated with the central aperture portion to mirror a profile of a corresponding pad, the solder mask further defining clearance regions that are substantially 2 mils wide around each pad of the set of pads.
15. The circuit board of claim 11 wherein each pad of the set of pads substantially has:

a first length along a first axis and the first length
along a second axis that is substantially perpendicular to the
first axis, and

5 a second length along a third axis and the second
length along a fourth axis that is substantially perpendicular
to the third axis; and

wherein the first and second axes are pivoted from the third and fourth axes by
substantially 45 degrees, wherein the first length is substantially 18 mils, and
wherein the second length is substantially 24 mils.

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16. A circuit board assembly, comprising:

a set of circuit board layers combined to form a rigid planar structure
having an outer surface;

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a pad layout including a set of pads arranged on the surface of a circuit
board in a two-dimensional array having at least two pads in a first direction and
at least two pads in a second direction that is substantially perpendicular to the
first direction, each pad of the set of pads having (i) a central portion and (ii)
multiple lobe portions integrated with the central portion and extending from the
central portion of that pad; and

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a circuit board component mounted to the pad layout via a set of solder
joints.

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17. The circuit board assembly of claim 16 wherein the circuit board component
includes a ceramic column grid array package having a set of column-shaped
contacts corresponding to the set of pads.

18. The circuit board assembly of claim 16 wherein the circuit board component includes a ball grid array package having a set of ball-shaped contacts corresponding to the set of pads.
- 5 19. A circuit board assembly, comprising:
a set of circuit board layers combined to form a rigid planar structure having an outer surface;
a pad layout including a set of pads arranged on the surface of a circuit board in a two-dimensional array having at least two pads in a first direction and
10 at least two pads in a second direction that is substantially perpendicular to the first direction, each pad of the set of pads having (i) a central portion and (ii) multiple lobe portions integrated with the central portion and extending from the central portion of that pad;
a circuit board component; and
15 means for mounting the circuit board component to the set of pads of the pad layout.
20. A method for fabricating a circuit board, the method comprising:
forming a rigid planar structure; and
20 providing a pad layout on the rigid planar structure, the pad layout including a set of pads arranged on a surface of the rigid planar structure in a two-dimensional array having at least two pads in a first direction and at least two pads in a second direction that is substantially perpendicular to the first direction, each pad of the set of pads having (i) a central portion and (ii) multiple lobe
25 portions integrated with the central portion and extending from the central portion of that pad.
21. The method of claim 20, further comprising:

placing a solder mask on the rigid planar structure, the solder mask extending around a periphery of each pad of the set of pads of the provided pad layout, the solder mask defining a set of apertures, each aperture having (i) a central aperture portion and (ii) multiple lobe aperture portions integrated with the central aperture portion to mirror a profile of a corresponding pad, the solder mask further defining a clearance region that is substantially 2 mils wide around each pad of the set of pads.

22. A method for making a circuit board assembly, the method comprising:
- providing a circuit board which has a pad layout including a set of pads arranged on a surface of the circuit board in a two-dimensional array having at least two pads in a first direction and at least two pads in a second direction that is substantially perpendicular to the first direction, each pad of the set of pads having (i) a central portion and (ii) multiple lobe portions integrated with the central portion and extending from the central portion of that pad;
- printing solder paste onto the set of pads;
- placing a circuit board component over the set of pads and in contact with the printed solder paste; and
- applying heat to activate flux within the solder paste and to melt solder within the solder paste thus mounting the circuit board component to the pad layout.
23. The method of claim 22 wherein the circuit board component includes a ceramic column grid array package having a set of column-shaped contacts corresponding to the set of pads, and wherein placing the circuit board component over the set of pads and in contact with the printed solder paste includes:
- registering the set of column-shaped contacts with the set of pads and putting the set of column-shaped contacts in contact with the printed solder paste.

24. The method of claim 22 wherein the circuit board component includes a ball grid array package having a set of ball-shaped contacts corresponding to the set of pads, and wherein placing the circuit board component over the set of pads and in contact with the printed solder paste includes:
- 5 registering the set of ball-shaped contacts with the set of pads and putting the set of ball-shaped contacts in contact with the printed solder paste.